

**O60: ARHL and Tinnitus in Portuguese Population: what we can hear from a sample of elderly individuals.**

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Currently it is known that 1/3 of individuals with more than 65 years old can have presbycusis or age-related hearing loss (ARHL). The WHO estimates that in 2025, there will be 1.2 billion people over 60 years of age worldwide, with more than 500 million individuals who will suffer from significant presbycusis. Many individuals will wait several years before seeking help for the hearing loss (HL), due to the insidious onset of the disorder as well as the negative stigma associated with hearing aid. Generally, even in developed societies, individuals accept some degree of HL as inevitable and do not consider it a treatable disorder. ARHL can lead to progressive social withdrawal, depression, isolation and significant familial stress. The impact of HL can be further compounded by the higher incidence of HL in individuals with other coexisting functional limitations. It is reported that about 30% of the individuals with ARHL also have tinnitus, this leading to the increase of elderly frailty. Several studies referred the possibility of common metabolic pathways between ARHL and tinnitus, all damaging the cochlea at the level of the organ of Corti, by affecting hair cells and the stria vascularis cells.

Considering the pathophysiological mechanisms of ARHL, it is assumed that with aging occurs a progressive hypoperfusion within the cochlea leading to ischemia and an increase of free radicals, highly toxic and harmful to the auditory neuroepithelium. These free radicals contribute for genome mutations and mtDNA alterations, thus leading to the reduction of mitochondrial membrane potential, contributing for the formation of bioenergetically inefficient mitochondria.

The genetic susceptibility associated with ARHL has been described through the association between presbycusis and different genes involved in hereditary deafness or oxidative metabolism as well as with specific mitochondrial haplogroups.

In the present study, epidemiological and psychological data are presented for about 450 elderly individuals (over 65 years old) from the Portuguese population. The results of the study of genetic variants concerning NAT2 and GRM7 genes are presented. We also report a wide range of mtDNA haplogroups identified in the subjects, which was expected in the Portuguese population. Gender comparisons are discussed considering hearing loss and audiological patterns. Elderly individuals aged 70-80 or >80 years have significantly more probability of having ARHL, as already described. As regard emotional and social difficulties, the worst listeners present more difficulties and more depressive symptoms, being this more common in women. Of the total of the individuals from our sample, about 39% reported tinnitus, being observed several differences in the age of onset, severity or even laterality. We discuss the differences and similarities at the genetic and epidemiological levels for this subgroup with tinnitus as compared with the other individuals as an attempt of contribution for the association between ARHL and tinnitus.